In Yoga, we can practice repetition to change deeply embedded physical, psychological, or emotional patterns.

By Sandra Uyterhoeven

This article will first present a brief overview of the autonomic nervous system (ANS). With a basic understanding of how the ANS works, we can then consider how Yoga practices that influence the ANS can help us re-educate the mind.

Function of the ANS

The ANS controls involuntary functions of the body, operating for the most part well below the level of consciousness. It differs in these respects from the somatic nervous system, which controls voluntary bodily functions, is consciously perceived, and is therefore easier to influence. The parts of the body influenced by the ANS are cardiac muscle, smooth muscle, and glandular tissue. Smooth muscles of the ANS include lungs, liver, large and small intestines, reproductive organs, and elimination systems. Glandular tissue includes two types of glands: endocrine, which are hormone producing glands such as the adrenals, thyroid, pituitary; and exocrine, which are sweat glands, oil producing glands of the skin, and digestive glands such as the gall bladder, pancreas, and others.

Two Divisions of the ANS

The ANS has two divisions: the sympathetic nervous system (SNS) and the parasympathetic nervous system (PNS). The sympathetic nervous system is a system for short-term survival. It excites the body, preparing it for action. Any signal of danger or disturbance—real or perceived—can set in motion a process known as the stress response. The SNS alerts your heart rate, blood pressure, clotting mechanisms, blood sugar level, respiration, and voluntary muscles to prepare for action. At the same time, it signals your digestive and elimination systems, sensitivity to pain, and other systems not needed for self-defense to slow or shut down. The effects of the SNS are immediate, widespread, and long-lasting.

In contrast, the parasympathetic nervous system is a system of long-term survival. It promotes rest and regeneration. The acronym SLUDD succinctly summarizes the functions of the PNS: salivation, lacrimation, urination, defecation, and digestion. In addition, this system redirects blood flow back to the core of the body. The PNS system is characteristically slower to take effect than the SNS, and its effects are less widespread.

In this system of dual innervation, most organs receive nerve impulses from both the sympathetic and parasympathetic nervous systems. While the two divisions are activated under different circumstances, both are vital to our survival and well-being.

The Stress Response

The stress response, which is characterized by sympathetic activation, occurs in three stages: an initial fight-or-flight response, which mobilizes the body for immediate action, a slower resistance reaction, and possibly a stage of exhaustion. When a stressor provokes the fight-or-flight response, the hypothalamus and pituitary gland send nerve impulses from the brain to the sympathetic division of the ANS. The impulses redirect energy to the muscles and organs needed for immediate survival, and away from those not needed for immediate survival. For example, the digestive, reproductive, and urinary systems become impaired or shut down.

The second stage, the resistance reaction, is initiated by hypothalamic releasing hormones, which stimulate the release of cortisol, human growth hormone, and thyroid hormone. By producing increased energy, and by helping the body repair damaged cells and reduce inflammation, these hormones enable the body to continue to fight the stressor after the initial response dissipates.

Most of the time, these two stages suffice to get the body through stressful situations. Sometimes they do not, and the body moves into the exhaustion stage, in which it continues to produce large amounts of stress hormones. Prolonged exposure to these hormones, particularly cortisol, can have devastating effects.

In our daily lives, we encounter many internal and external stressors, and if we fail to discharge our response to stress through physical activity (such as the well-known “fight” of our ancestors, or more enjoyable activities today), we may become chronically stressed. A sustained high level of cortisol destroys healthy muscles, bones, and cells, suppresses the immune system, impairs digestion, and weakens endocrine function. The destructive effects of chronic stress put people at greater risk of chronic disease and premature death.

While the stress response is extremely useful as a survival mechanism, it is equally detrimental if invoked when not needed for survival, or chronically invoked. Therefore, it is vitally important that we activate the SNS only when there is real danger, or a need for physical activity, when we can discharge its effects through appropriate action.

Through conditioning and repeated practice, we have learned to invoke the stress response on inappropriate occasions. Why not use the same techniques of conditioning and practice to reverse this behavior?
Can Yoga Change Our Relationship to the ANS?

It is widely recognized that most of what activates the fight-or-flight response is in reality not a matter of life and death. When the source of stress is psychological rather than physical danger, there is the opportunity to change the habitual pattern that triggers the sympathetic nervous system. In particular, Yoga techniques offer the possibility of reducing inappropriate activation of the sympathetic nervous system.

The calming effects of savasana, Yoga nidra, and pranayama have been widely studied and reported. The effects of these practices provide a great service to many Yoga aspirants by giving them a short-term “time out” from stress, and also by creating positive physiological changes in bodily systems (including the nervous system). For example, deep breathing activates the parasympathetic nervous system, possibly because regular movement of the diaphragm stimulates the vagus nerve. These practices can induce the relaxation response, which provides a healthy respite from chronic stress.

While these techniques are valuable, they may only calm us temporarily. If underlying patterns in our psyches continue to trigger the fight-or-flight response inappropriately, we end up simply repeating the same old patterns. Such patterns are often deep, long-standing, and subconscious. Unless we choose to change them and develop tools to do so, the fallback position is to repeat and reinforce the patterns, making already strong tendencies ever stronger. In Yoga, we can practice repetition to change deeply embedded physical, psychological, or emotional patterns. We can use repetition in meditation to observe and understand our behavior patterns, and then create new ones. Imagine the profound and lasting effects that could result from changing these deeper patterns that affect the way we view ourselves, others, and the world!

The Change Process

A good way to increase our understanding of our behavior patterns is through meditation on the patterns themselves (Sutra III.18). In Sutra III.9, Patanjali describes what is often referred to today as cognitive reframing. In the language of the Yoga Sutras, this term equates to reprogramming our individual citta (mind or energy field) as part of the process of transformation.

How does this work? Through our thoughts and our actions, we are continually recording patterns on citta. Patanjali shows us that we have the choice of reinforcing old patterns and, thus, repeating the same behaviors, or creating new patterns and changing our behavior. By choosing to focus the mind, we can end the distractions that cause the mind to be agitated. An agitated state of mind calls up unconscious tendencies associated with the stress response, while a focused mind evokes patterns associated with the parasympathetic, rest and regeneration response.

Each time we consciously focus the mind, ending a vrtti (disturbance), we are reprogramming our individual citta. Patanjali calls this process nirodah parinama. When we do this continually, a new pattern emerges, the old pattern recedes, and we experience the calm flow of transformation described in Sutra III.10. Because transformation is a journey inward, the old pattern being replaced is called the vyutthana (externalization) samskara.

Researchers studying the effects of meditation (see “Meditation and Change in the Brain” above) have found changes in both brain activation and emotion experience. Is this process of change, described by Patanjali, the process that contemporary researchers are measuring?

Meditation

Dhyana meditation, described in Patanjali’s Yoga Sutras, is a powerful tool for managing stress. By definition, dhyana
meditation requires one to focus attention in a sustained way on
an object such as the breath, a word with positive connotations
(for example, the word “contentment”) or another mantra or
object. In Chapter III, Patanjali offers numerous examples of
objects of meditation, along with expected results. By practicing
dhyana meditation consistently, we become imbued with the
quality upon which we are meditating, and we change. With
repeated meditation, the quality grows stronger in us, until the
object of meditation becomes our reality.

To experience this phenomenon, try meditating on the strength
of an elephant (Yoga Sutra, Patanjali, III.24) and notice how
strong you feel, after even a short meditation. This idea of taking
on the quality of your object of focus helps to explain why
sangha—the company we keep—is such a strong influence on
our character.

How does this relate to the autonomic nervous system?
By turning our attention (through meditation, visualization,
or sangha) to positive qualities, the positive qualities become
dominant and our negative qualities become weakened or
dormant. Negative reactions (fear, anger, anxiety, resentment)
that trigger the sympathetic nervous system inappropriately are
less likely to occur. There seems to be a Sutra for every life
situation, and this one is no exception: tajjah sanskaaro 'nyasa
mskaarapratihandhi (Yoga Sutra, Patanjali, I.50). This newly
acquired quality born of insight (prajna) eclipses or dominates
the other tendencies.

Substituting The Opposite
Patanjali explains the concept of pratipaksa bhavanam, which
means to substitute the opposite, or, when something is causing
you to feel troubled, to take a different perspective. This practice,
too, requires awareness, self-observation, and repetition. For
example, one could replace anger or hostility with love. Shortly
after my divorce I was feeling a lot of anger. In meditation,
I asked the question, “How can I free myself of this anger?”
The answer came in a flash, like lightning: “Replace the anger
with love; you will never be completely rid of the anger, but
as the love grows, the anger will subside.” That is indeed what
happened. Each time anger arose, I acknowledged it by saying,
“i see you’re still there, but I am not going to allow you to
dominate me,” and I would substitute thoughts of ahimsa or
lovingkindness. Many years later, when I began studying the
Yoga Sutras, I realized I had been practicing the principle of
pratipaksa bhavanam.

Applying the same principle, one could simply adopt another
point of view in order to gain a different perspective. Gary
Kraftsow, founder and teacher of the American Viniyoga
Institute, wove this technique into a Yoga practice. After leading
his students through asana and pranayama, Gary asked them to
“recall an argument you had with someone you love.” In a brief
period of meditation, he asked them to “reflect on the situation
that gave rise to the argument. Then imagine a different scenario
in which the argument would not have occurred and the enmity
would have been abandoned.” Kraftsow’s application of the
pratipaksa bhavanam principle illustrates another way we can
avoid triggering the sympathetic nervous system when there is no
actual danger.

Persistence with Detachment
Patanjali, back in circa 600 B.C.—200 A.D., advocated
repetition, constant practice, and to that he added “detachment
from the results” (Yoga Sutra 1.12). It’s easy to imagine why
Patanjali added the piece about detachment. He probably realized
we would defeat our purpose by applying anxiety-producing
patterns (“Am I doing this right?” or “How soon will I achieve
this goal?”) that could undermine the process. By practicing
these techniques over and over again without concern about
results, the results do come, usually when you are least expecting
them. There is a Yoga saying, “Do everyday and you become
that.” And that’s how repetition works: one day you realize you
have become a different person. The practices have taken hold,
they have changed you, and you find that your mind and body’s
autonomic responses are one more example of skill in action.

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